**Chapter 3: Linear Motion & 4 Acceleration**

1. An airplane flies at 100 km/h in still air.. If it flies into a 10 km/h headwind, its ground speed is 9/h

1. A horse gallops a distance of 10 kilometers in a time of 30 minutes. It's average speed is 20 km/h
2. A car maintains a constant velocity of 100 km/hr for 10 seconds. During this interval it acceleration is zero
3. Twelve seconds after starting from rest, an object falling freely will have a speed of more than 100 m/s
4. If a car increases its velocity from zero to 60 km/h in 10 seconds, its acceleration is 6 km/h/s
5. If a rocket initially at rest accelerates at a rate of 50 m/s2 for one minute, its speed will be 3000 m/s
6. At one instant an object in free fall is moving downward at 50 meters per second. One second later its speed should be about 100 m/s
7. One half second after starting from rest, a freely-falling object will have a speed of about 5 m/s
8. An apple falls from a tree and hits the ground 5 meters below. It hits the ground with a speed of about 10
9. If a projectile is fired straight up at a speed of 10 m/s, the time it takes to reach the top of its path is about1 second
10. Disregarding air drag, how fast must you toss a ball straight up in order for it to take 2 seconds to return to the level from which you tossed it? 10 m/s
11. A ball is thrown 125 meters upward and then falls the same distance back to Earth. Neglecting air resistance, its total time in the air is about 10 seconds
12. A bullet is dropped into a river from a very high bridge. At the same time, another bullet is fired from a gun, straight down towards the water. Neglecting air resistance, the acceleration just before striking the water is the same for each bullet

* The dropped is faster
* The shot is faster
* They are the same

**Chapter 4: Newton's Second Law of Motion: Force and Acceleration**

1. An object is pulled northward by a force of 10 N and at the same time another force of 15N pulls it southward. The magnitude of the resultant force on the object is 5 N
2. An apple weighs 1 N. When held at rest above your head, the net force on the apple is ON
3. An apple at rest weighs 1 N. The net force on the apple when it is in free fall is 1N
4. A 1-kg mass at the earth's surface weighs 9.8 N
5. A car has a mass of 1000 kg and accelerates at 2 meters per second per second. What is the magnitude of the net force exerted on the car? 2000 N
6. The mass of a pet turtle that weighs 10 N is about 1 kg
7. A man weighing 800 N stands at rest on two bathroom scales so that his weight is distributed evenly over both scales. The reading on each scale is 400 N
8. A jumbo jet has a mass of 100,000 kg. The thrust for each of its four engines is 50,000 N. What is the jet's acceleration in meters per second per second when taking off? 2
9. A skydiver of mass 100 kg experiences air resistance of 500 N, and an acceleration of 5 or more
10. An object released from rest on another planet requires one second to fall a distance of 6 meters. What is the acceleration in meters per second per second due to gravity on this planet? 12
11. The human body can, under certain conditions, withstand an acceleration of 10 g. What net force would produce this acceleration of a 50-kg person? about 5000 N
12. Light travels in a straight line at a constant speed of 300,000,000 m/s. What is the acceleration of light?zero